

Application No. 10/080,630
Response to Final Office Action

Customer No. 01933

Listing of Claims:

1. (Previously Presented) An image-processing method for creating processed image data from source image data via an image-conversion processing including at least one spacial-filtering processing, said method comprising:

5 setting at least one predetermined upper-limit value for a variation amount indicating an amount of difference between said source image data and said processed image data; and then

10 performing said image-conversion processing to convert said source image data into said processed image data by applying said at least one spatial-filtering processing to the source image data within a range of said variation amount limited by said predetermined upper-limit value.

2. (Previously Presented) The image-processing method of claim 1, wherein said at least one spatial-filtering processing comprises a plurality of different spatial-filtering processings, a predetermined upper-limit value for a variation amount is set
5 for each of the plurality of spatial-filtering processings based on characteristics of the respective spatial-filtering processings, and the plurality of spatial-filtering processings are performed one of simultaneously in parallel or and sequentially one by one.

Application No. 10/080,630
Response to Final Office Action

Customer No. 01933

3. (Previously Presented) The image-processing method of claim 2, wherein said plurality of spatial-filtering processings comprise a first spatial filter for emphasizing an amplitude of image data in a first spatial frequency band, and a second
5 spatial filter for de-emphasizing an amplitude of image data in a second spatial frequency band;

wherein a first upper-limit value is set as the predetermined upper-limit value for the first spatial filter, and a second upper-limit value is set as the predetermined
10 upper-limit value for the second spatial filter; and

wherein said first spatial frequency band is higher than said second spatial frequency band, and said first upper-limit value is greater than said second upper-limit value.

4. (Previously Presented) The image-processing method of claim 2, wherein said plurality of spatial-filtering processings comprise a corresponding plurality of spatial filters and each of said plurality of spatial filters corresponds to a respective one
5 of said plurality of spatial-filtering processings; and

wherein each of said spatial-filtering processings is only applied to pixel data when an absolute value of a variation amount for the corresponding spatial-filtering processing is higher than a predetermined lower-limit value, said absolute

Application No. 10/090,630
Response to Final Office Action

Customer No. 01933

- 10 value of the variation amount being derived by applying said spatial-filtering processing to each pixel data value corresponding to the spatial filter of said corresponding spatial-filtering processing.

Claims 5 and 6 (Canceled).

7. (Previously Presented) An image-processing method for creating a variable sized image by applying one of an enlargement processing and a reduction processing to source image data including a plurality of color components, said method

5 comprising:

applying a plurality of different spatial-interpolation processing methods to said source image data, said spatial-interpolation processing methods corresponding respectively to said plurality of color components;

wherein at least one of said spatial-interpolation processing methods for processing a corresponding one of the color components is performed in accordance with a magnification factor of said enlargement processing or reduction processing;

wherein said spatial-interpolation processing methods are performed by employing weighted-addition average values of a plurality of pixels, based on look-up tables of weighting

Application No. 10/080,630
Response to Final Office Action

Customer No. 01933

coefficients corresponding to said plurality of
spatial-interpolation processing methods; and

wherein a new look-up table is created by performing a
weighted averaging operation with said look-up tables in
accordance with the magnification factor, and said at least one
spatial-interpolation processing method that is performed in
accordance with the magnification factor is performed by
employing the new look-up table.

Claim 8 (Canceled).

9. (Previously Presented) An image-processing method for
creating processed image data by applying a spatial-filtering
processing and one of an enlargement processing and a reduction
processing to source image data, when a magnification factor of
5 said one of the enlargement processing and the reduction
processing is lower than a predetermined value, said method
comprising:

performing (i) a first size-varying processing to vary a
size of an image to a predetermined intermediate size, and (ii) a
10 first angle-rotating processing to rotate said image by a
predetermined first angle value;

Application No. 10/080,630
Response to Final Office Action

Customer No. 01933

applying said spatial-filtering processing to image data processed by said size-varying processing and said angle-rotating processing; and

- 15 performing(i) second size-varying processing to further vary said size of said image to a predetermined objective size, and (ii) second angle-rotating processing to reversely rotate image by a second angle value, said second angle value being opposite said first angle value.

Claims 10 and 11 (Canceled).

12. (Currently Amended) An image-processing method comprising:

- extracting a plurality of couples of pixels, each of said couples of pixels comprising two pixels positioned symmetrically
5 with respect to an objective pixel to be processed through an image-processing;

calculating differential values between said two pixels and said objective pixel for each of said plurality of couples of pixels;

- 10 extracting a specific couple of pixels having a minimum differential value out of said plurality of couples of pixels;
when said minimum differential value is lower than a predetermined first threshold value, setting a weighted-addition

Application No. 10/080,630
Response to Final Office Action

Customer No. 01933

average value of said specific couple of pixels and said
15 objective pixel, as a new value of the objective pixel;
establishing a new threshold value by adding a predetermined
positive value to said minimum differential value;
extracting all of the couples of pixels having differential
values lower than said new threshold value; and
20 setting an average value of ~~of~~ said extracted couples of
pixels, as a value of the objective pixel.

Claim 13 (Canceled).

14. (Previously Presented) An image-processing method for
processing source image data, said method comprising:

setting a predetermined first threshold value and a maximum
radius from a noticed pixel to an objective pixel in the source
5 image data, said noticed pixel being a pixel to be processed by
an image-processing, and said objective pixel being an object for
comparison;

applying a signal-smoothing processing to said source
image data based on the first threshold value and a differential
10 value between said noticed pixel and said objective pixel to
generate second source image data;

Application No. 10/080,630
Response to Final Office Action

Customer No. 01933

setting a second threshold value, which is smaller than said first threshold value, and an expanded radius, which is larger than said maximum radius; and

- 15 applying said signal-smoothening processing to said second source image data based on the second threshold value and the expanded radius.

15. (Previously Presented) The image-processing method of claim 14, wherein said source image data is obtained by applying a gradation-converting processing to image data outputted by an image inputting apparatus, and at least one of said first
5 threshold value and said second threshold value is determined based on gradation-conversion characteristics in the vicinity of a signal value of said noticed pixel.

Claims 16 and 17 (Canceled).

18. (Previously Presented) An image-processing apparatus for processing an image, comprising:

- an image-inputting section to acquire image data of a source image from an image recording medium or a document having said
5 source image thereon;

an image-processing section to apply the image-processing method recited in claim 1 to said image data acquired by said

Application No. 10/080,630
Response to Final Office Action

Customer No. 01933

image inputting section, so as to create processed image data;
and

10 an image-outputting section to output said image in at least
one of: a first mode in which said processed image data is
written onto an information-recording medium, a second mode in
which said processed image is printed, and a third mode in which
said processed image data is displayed on an image-displaying
15 device.

19. (Original) An image-processing method for creating
processed image data by applying a spatial-filtering processing
and a size-converting processing in an enlarging direction to
source image data, comprising the steps of:

5 determining whether an effect of a sharpness-emphasizing
processing, to be performed in said spatial-filtering processing,
should be relatively strong or weak, based on instructive
information in regard to image-processing items inputted in
advance; and
10 applying said spatial-filtering processing at first, and
then, said size-converting processing to said source
image data, when determining that said effect of said
sharpness-emphasizing processing should be relatively strong; or
applying said size-converting processing at first, and then,
15 said spatial-filtering processing to said source image data, when

Application No. 10/080,630
Response to Final Office Action

Customer No. 01933

determining that said effect of said sharpness-emphasizing processing should be relatively weak.

20. (Original) An image-processing apparatus for processing an image, comprising:

an image-inputting section to acquire image data of a source image from an image recording medium or a document having said

5 source image;

an instructive-information inputting section to input instructive information in regard to image-processing items to be performed in said image-processing apparatus;

an image-processing section to apply an image-processing to
10 said image data acquired by said image inputting section, so as to create processed image data; and

an image-outputting section to output said image in either a first mode that said processed image data are written onto an information-recording medium, or a second mode that said image is
15 written on an image recording medium to obtain a hardcopy, or a third mode that said image is displayed on an image-displaying device;

wherein said image-processing section determines whether an effect of a sharpness-emphasizing processing, to be performed in
20 a spatial-filtering processing, should be relatively strong or weak, based on said instructive information in regard to said

Application No. 10/080,630
Response to Final Office Action

Customer No. 01933

image-processing items inputted by said instructive-information
inputting section; and

wherein said image-processing section applies_said
25 spatial-filtering processing at first, and then, said
size-converting processing to said image data, when determining
that said effect of said sharpness-emphasizing processing should
be relatively strong; or said image-processing section applies
said size-converting processing at first, and then, said
30 spatial-filtering processing to said image data, when determining
that said effect of said sharpness-emphasizing processing should
be relatively weak.

Claims 21-23 (Canceled).